

Tea tree spray water quality

Managing spray water quality

There are three key factors that impact the result of a spray applications:

1. pH
2. Bicarbonate concentrations
3. Hardness.

Each of these effects the performance of spray applications differently, but all lead to poor knock-down results and can contribute to longer-term herbicide resistance. Salinity and turbidity also need to be considered when assessing spray water quality.



Key points

- Poor water spray quality results in poor plant coverage, incorrect application rates and resistance longer-term.
- Good water quality for spraying chemicals is essential for effective control of pests, weeds, and diseases.
- Water testing should be completed on a regular basis when the water is sourced from bores, rivers, streams and unlined dams.
- A water test to analyse spray water should include the following: pH, total hardness- (including bicarbonates), TDS (total dissolved salts) and salinity.

Figure 1: Key spray water considerations and quality parameters

pH

Spray water that has pH>8 can cause chemical breakdown, have poor droplet contact, and reduce performance of additives designed to improve herbicide effectiveness, known as adjuvants. Acidifying adjuvants (e.g., surfactant products) can be used to lower pH to a more acceptable level.

Bicarbonates

Bicarbonate (HCO_3^-) is an important negatively charged anion in water that contributes to hardness. Bicarbonate levels 250-300 parts per million (ppm) can affect the efficacy of certain herbicides, especially 2, 4-D amine and some Group A herbicides.

Hardness

Hardness is a measure of the concentration of positive ions in the water. Positive ions with a strong charge (e.g., calcium and magnesium) can bind with negatively charged products, such as weak acid herbicides (e.g., glyphosate), causing them to lose their efficacy. Water is classified as hard at 250-300ppm.

Salinity

Salinity is measured as the Electrical Conductivity (EC) of the water. Salinity levels >1000ppm sodium chloride, or ECs above 0.5 to 1 decisiemens/cm can result in some chemicals precipitating out of the solution and can cause other chemicals to be inactivated. There is no easy fix for saline water other than diluting it with rainwater or avoidance.

Dirty Water (Suspended solids)

Water that is dirty or has high levels of turbidity will impact the performance of most commonly used herbicides. This is due to the presence of clay colloids that readily absorb the chemicals, effecting concentration of the mix and therefore reducing the rate of application. Dust generated by the sprayer can contribute to this issue.



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What can we do about it?

If spray water testing reports results outside the ideal water quality parameters, there are treatment products available to help to ameliorate the water.

If you have a high pH: treat with an adjuvant such as LI700 ®, a non-ionic penetrating surfactant that acts as an acidifier to reduce pH to between 4-5 in most cases. Surfactants also reduce the surface tension of the water, thereby increasing its spreading and wetting properties.

If your water is hard or has high bicarbonates: treat with an ammonium sulfate based adjuvant, such as Liase ®, that counteract the efficacy issue of bicarbonates and minimise antagonism in the tank when mixing glyphosate with other herbicides.

If you have an option to seek and test an alternative water source, under certain scenarios this may be the most effective strategy for improved use of labour resources, input costs and performance outcomes.

Collecting water samples for testing

If you are going to sample water, it's important to use correct collection methods to ensure an accurate result. Follow these simple steps:

- Use a clean container of at least 500ml in size.
- Rinse the bottle at least 4 times with the sample water.
- Fill the bottle to the top, leaving little or no airspace and seal tightly.
- Label the bottle accurately with where the sample was taken and the date and intended use.
- Wrap the sample in aluminum foil to prevent degradation.
- Send to the lab or provide to your reseller as soon as possible.

Should I get my water tested?

If the water that you use for spraying is sourced from a bore, an unlined dam, river or stream, it is recommended that a water test be used to check the quality of the water before spraying. As water quality of aquifers can vary over time, it is recommended to test water annually.

Where do I get my water tested and how much does it cost?

There are many laboratories across Australia that offer dedicated spray water quality testing. Your local reseller can organise testing of your water for you with prices ranging from \$60 to \$80 per sample, depending on the number of samples and postage costs.

What if I'm unsure about the spray water quality and don't have time to test?

The best thing you can do in this situation is to make sure your tank mix will be stable by conducting a jar test. Ensure you are using the recommended rate of application and, if applicable, use an acidifying buffer/adjuvant and ammonium sulfate where needed.

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